

UNIVERSITI TEKNOLOGI MARA

**RATE LIMITING ALGORITHM ON VIDEO
TRAFFIC WITH PARETO TRAFFIC MODEL IN
BROADBAND NETWORK**

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ABSTRACT

Bandwidth management is one of the major issues for Quality of Service (QoS) for network traffic. Most network administrators are looking at providing best QoS and reliable traffic performances especially on video traffic. Thus, monitoring network traffic activity is a crucial task in providing better bandwidth usage. This research presents an analysis on real time video network traffic in a Broadband Network in Malaysia. Real data is captured and collected at one of a telecommunications service company based for Business and Home Streamyx users in Johor. Statistical analysis is derived and new traffic model and characterizations are presented. Goodness of fit (GoF) and Kolmogorov Smirnov (KS) test is used to fit the real data to get a best Traffic distribution model. Results present four top video used in the network traffic which are You Tube, MPEG, TV on Streamyx and Dailymotion using identified video protocol. Fitted traffics presents Pareto model is best fitted on video traffic and Empirical Cumulative Distribution function (CDF) derived a Generalized Pareto (GP) distribution is the best fitting model for video traffic. GP characterization presents three important parameters which are shape, scale and location. By increase value of shape parameter is helps in controlling some burst traffic over identified bandwidth threshold. A new mathematical formulation is derived with present policing and shaping process by using the GP traffic model. As a result, policed and shaped make 60%, 35%, 47% and 45% usage to reach full utilization of 100Kbyte, 10Kbyte, 9Kbyte and 5Kbyte. Thus, traffic policing and shaping helps to optimize bandwidth utilization and to avoid frame loss of bandwidth.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Rapid increase of network traffic access in social networking media and video streaming has created complex set of data network traffic. Whenever the network traffic continues to operate, the more bandwidth is utilized. Analysing on traffic data will provide information such as average load, bandwidth requirement for different protocols and many other details. An increasingly of bandwidth usage which impact network capabilities of traffic performance. Thus, it is important to monitor bandwidth consumption activities in real time broadband network and analyse network traffic to allow better quality of service (QoS).

Network traffic performances are unpredictable and have variety of traffic such as video, audio, photo, large and small data transfer and so many more. Traffic models are used to estimate parameters and evaluate congestions of traffic performance. Many network traffic models has been identified however, real traffic models keep changing over time. Each traffic model has different characteristics to fits network environment distributions [1]. Thus understanding of latest traffic model is important especially in a broadband network.

Traffic model is design to verify the real broadband network performance. Performance technique of traffic modelling is to determine the best technique use for traffic congestion control [2]. There have three principle consideration parts in order to design traffic model which are need to ensure accurate and fit traffic modelling,